presented in Table 7. Data in Table 7 are the average of two replicates and present O.D. measurements as a function of increasing amounts of liposome solution (μl) added to transfection solutions. Data for 10 μl and 30 μl additions of heat- and UV-inactivated SFV(p-SFV1-tdt), the no-virus control and cells only control are provided. Data in Table 7 are not normalized for protein content. The amount of DNA, the total amount of lipid, the relative amounts of cationic and neutral lipid and freeze-thaw treatment were not optimized in these assays.

Even though the liposome preparation has not been optimized for these transfection assays, the data in Table 7 show a significant enhancement of transfection (as expression of β-gal) in cells treated with the combination of cationic lipid and SFV over those treated with cationic lipids alone.

TABLE 7

Tranfection of BHK cells with Cationic Liposomes incorporating SFV

	β-Gal Assay	
Transfection Treatment	Liposome solution (μl)	O.D.$_{420\ nm}$
10 μl heat-inactivated SFV + Lipid	1	0.003
	3	0.193
	10	0.152
	30	0.003
30 μl heat-inactivated SFV + Lipid	1	0.004
	3	0.521
	10	0.182
	30	0.013
10 μl UV-inactivated SFV + Lipid	1	0.003
	3	0.551
	10	0.331
	30	0.037
30 μl UV-inactivated SFV + Lipid pCMVβgal	1	0.004
	3	0.437
	10	0.197
	30	0.012
No Virus Lipid Control	1	0.007
	3	0.107
	10	0.003
	30	0.002
Cells Only Control		0.002

EXAMPLE 7

Transfection of Human Fibroblast Cells Employing Cationic Liposomes Incorporating Fusion Peptides from Enveloped Viruses.

Peptides from Influenza virus hemagglutinin (E5 amphiphilic peptide) and Vesicular Stomatitis virus glycoprotein (VSV G protein) were synthesized using standard Fmoc peptide synthesis. See: Kamata, H. et al. (1994) Nucleic Acids Res. 22:536–537 (peptide E5); Schlegel, R. and M. Wade (1985) J. Virol. 53:319–323 (peptide KFT (6)); and Stewart et al. (1984) *Solid Phase Peptide Synthesis*, Pierce Chemical Company, Rockford, Ill. These peptides had been identified as active in mediating membrane fusion during infection by their respective viruses.

Human primary fibroblast (HPF) cells were plated in 24-well tissue culture dishes (8×10^4 to 1×10^5 cells per well) and incubated overnight in DMEM complete. Growth medium was removed from cells and they were washed once with serum-free DMEM and 250 μl DMEM was added to each well. Transfection compositions containing "LIPOFECTAMINE" (Gibco/BRL: Life Technologies, Inc., Gaithersburg, Md.), DNA and peptides were prepared as follows:

Peptides were dissolved at 300× final concentration (see table) in water. For each well, 25 μl of a DNA solution containing 0.2 μg pCMVβ in "OPTI-MEM" I (Gibco/BRL: Life Technologies, Inc., Gaithersburg, Md.) and a 25 μl solution containing varying amounts of the liposome solution were mixed and incubated for 15 min at room temperature to allow complex formation. One microliter of peptide solution was then added to the complex containing solution, after which the whole complex containing solution was added to the cells. Cells were incubated (37° C., 5% CO_2) for 6 hrs. one milliliter of cell growth medium (DMEM complete) was added, and the cells were incubated for an additional 24 hr. Cells were harvested and assayed for β-gal activity, as described in Example 3, except that the amount of β-gal enzyme present was determined by comparing OD measurements with those of a standard curve. Exemplary results of this transfection assay are presented in Tables 8 and 9. Data are single determinations.

Data in Tables 8 and 9 are not normalized for protein content. The amount of lipid solution (2 μl for mixtures with peptides) and DNA (0.2 μg) had been optimized in previous assays. The amount of peptide was not optimized.

Even though the amount of peptide added to the liposome-DNA complexes has not been optimized for these transfection assays, the data in Tables 8 and 9 show a significant enhancement of transfection (as expression of β-gal) in cells treated with the combination of cationic lipid, DNA and peptide over those treated with cationic lipid and DNA alone.

TABLE 8

Transfection of human fibroblasts (HPF) with pCMVβ DNA using "LIPOFECTAMINE" and viral fusion peptides from influenza hemagglutinin and vesicular stomatitis virus (VSV) G protein.

"LIPOFECTAMINE" solution (μl)	Influenza peptide (μM)	VSV peptide (μM)	ng β-galactosidase
2	0	0	7
3	0	0	21
2	1	0.1	57
2	1	1	61
2	3	0.1	43
2	3	1	25
2	10	0.1	84
2	10	1	52

TABLE 9

Transfection of human fibroblasts (HPF) with pCMVβ DNA using "LIPOFECTAMINE" and viral fusion peptides from influenza hemagglutinin and vesicular stomatitis virus (VSV) G protein.

"LIPOFECTAMINE" solution (μl)	Influenza peptide (μM)	VSV peptide (μM)	ng β-galactosidase
2	0	0	35
2	0.01	0.01	92
2	0.1	0.1	94
2	1	1	96
2	2	2	72
2	5	5	108
2	10	10	46

I claim:

1. A composition for transfecting a eukaryotic cell wherein said composition comprises a nucleic acid, a cationic lipid composition selected from the group consisting of